



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
PATENT

In re application of:  
**Calvez et al.** ) Group Art Unit: Unknown  
) )  
Serial No. 10/550,843 ) Examiner: N/A  
) )  
Filed: March 24, 2004 (I.A.) )  
) )  
For: IMPROVEMENTS IN AND )  
RELATING TO VERTICAL- )  
CAVITY SEMICONDUCTOR )  
OPTICAL DEVICES )

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Date Alicia Curran

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INFORMATION DISCLOSURE STATEMENT

Dear Sir:

Applicant wishes to call to the attention of the Examiner the documents cited on the accompanying Form PTO-1449. No concession is made that these documents are prior art, and applicant expressly reserves the right to antedate the documents as may be appropriate. Applicant requests that each of these documents be made of record in the above-identified application.

Respectfully submitted,

  
Frank J. Uxa  
Attorney for Applicant  
Reg. No. 25,612  
4 Venture, Suite 300  
Irvine, CA 92618  
(949) 450-1750  
Facsimile (949) 450-1764

Form PTO-1449		APR 20 2007	Docket No.: D-3214	Application No.: 10/550,843		
<b>INFORMATION DISCLOSURE CITATION IN AN APPLICATION</b> (Use several sheets if necessary)		U. S. TRADEMARK OFFICE	Applicant: Calvez et al.			
			Filing Date: March 24, 2004	Group Art Unit: Unknown		
<b>U. S. PATENT DOCUMENTS</b>						
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,052,016	09/1991	Mahbobjadeh et al.			
	5,461,637	10/1995	Mooradian et al.			
	5,513,203	04/1996	Damen			
	5,627,853	05/1997	Mooradian et al.			
	6,628,695	09/2003	Aldaz et al.			
	2002/0075929	06/2002	Cunningham			
<b>FOREIGN PATENT DOCUMENTS</b>						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION
						YES
	WO 95/25366	09/1995	International			
	WO 99/12235	03/1999	International			
	WO 00/10234	02/2000	International			
	WO 00/12235	03/2000	International			
	WO 00/25398	04/2000	International			
	WO 00/25399	04/2000	International			
	WO 01/59895	08/2001	International			
	WO 02/47223	06/2002	International			
<b>OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)</b>						
	AA	W.J. Alford et al., "High Power and good beam quality at 980 nm from a vertical external-cavity surface-emitting laser", <i>Journal of the Optical Society of America B (Optical Physics)</i> Opt. Soc. America USA, Vol. 19, No. 4, pages 663-666, 2002.				
	AB	C. Asplund et al, "1260 nm InGaAs vertical-cavity lasers", <i>Electronics Letters</i> , Vol. 38, No. 13, 2002, p.635-636				
	AC	D.I. Babic et al., "Double-fused 1.52-μm vertical-cavity lasers", <i>Appl. Phys. Lett.</i> (9), 27, 1995, P.1030-1032.				
	AD	W.W. Bewley et al, "Thermal Characterization of Diamond-Pressure-Bond Heat Sinking for Optically Pumped Mid-Infrared Lasers", <i>IEEE Journal of Quantum Electronics</i> , Vol. 35, No. 11, 1999, p. 1597-1601.				
	AE	E. Staffan Björlin, "High Gain, High Efficiency Vertical-Cavity Semiconductor Optical Amplifiers", <i>IPRM</i> , 2002, p. 307-310.				
	AF	A. Black, "Wafer Fusion: Materials Issues and Device Results", <i>IEEE Journal Sel. Topics in Quantum Electronics</i> , Vol. 3, No. 3, 1997, p. 943-951.				
EXAMINER			DATE CONSIDERED			
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						YES NO
<b>OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)</b>						
AG	M.J. Bohn, "Resonant optical pumping of vertical-cavity surface emitting lasers", <i>Optics Communications</i> , 117(1995) p. 111-115.					
AH	H. Bourdoucen, "Design of Ultra-Fast Dual-Wavelength Resonant-Cavity-Enhanced Schottky Photodetectors", <i>IEEE Journal of Quantum Electronics</i> , Vol. 37, No. 1, 2001, p. 63-68.					
AI	S. Calvez, "Optimization of an Optically Pumped 1.3- $\mu$ m GaInNAs Vertical-Cavity Surface-Emitting Laser", <i>IEEE Photonics Tech. Lett.</i> , Vol. 14, No. 2, 2002, p. 131-133.					
AJ	S.W. Corzine, "Design of Fabry-Perot Surface-Emitting Lasers with a Periodic Gain Structure", <i>IEEE Journal of Quantum Electronics</i> , Vol. 25, No. 6, 1989, p. 1513-1524.					
AK	R.P. Espindola, "High power, low RIN, spectrally-broadened 14xx DFB pump for application in co-pumped Raman amplification", <i>ECOC</i> , 2001.					
AL	C.L. Felix et al., "High-efficiency midinfrared "W" laser with optical pumping injection cavity", <i>Appl Phys Lett</i> , Vol. 75, No. 19, 1999, p. 2876-2878.					
AM	M.F. Ferreira et al., "Impact of Stimulated Brillouin Scattering on Fibre Raman Amplifiers", <i>Electronics Letters</i> , Vol. 27, No. 17, 1991, p. 1576-1577.					
AN	C.R.S. Fludger et al., "Pump to signal RIN transfer in Raman fibre amplifiers", <i>Electronics Letters</i> , Vol. 37, No. 1, 2001, p. 15-17.					
AO	A. Garnache et al., "Sub-500-fs soliton-like pulse in a passively mode-locked broadband surface-emitting laser with 100 mW average power," <i>Applied Physics Letters</i> , Vol. 80, No. 21, 2002, p 3892-3894.					
AP	M.D. Gerhold, "Novel Design of a Hybrid-Cavity Surface-Emitting Laser", <i>IEEE Journal of Quantum Electronics</i> , Vol. 34, No. 3, 1998, p. 506-510.					
AQ	M.A. Hadley et al., "High single-transverse-mode output from external-cavity surface-emitting laser diodes", <i>Appl. Phys. Lett.</i> , 63, 1607-1609, 1993.					
AR	S. Hamidi et al., "Effect of Pump Laser Mode Structure on the Gain of Forward Pumped Raman Fibre Amplifier in the Presence of Stimulated Brillouin Scattering", <i>Electronic Letters</i> , Vol. 28, No. 18, 1992, p. 1768-1770.					
AS	R. Häring et al., "Picosecond surface-emitting semiconductor laser with >200 mW average power", <i>Electronics Letters</i> , Vol. 37, No. 12, 2001, p. 766-767.					
AT	R. Häring et al., "High-Power Passively Mode-Locked Semiconductor Lasers", <i>IEEE Journal of Quantum Electronics</i> , Vol. 38, No. 9, 2002, p. 1268.					
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## FOREIGN PATENT DOCUMENTS

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						YES	NO

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AU	J. Harris, "Tunable Long-Wavelength Verticle-Cavity Lasers: The Engine of Next Generation Optical Networks?" <i>IEEE Journal Sel. Topics Quant. Electron.</i> , Vol. 6, No. 6, <b>2000</b> , p. 1150.
AV	M.A. Holm et al, "Actively Stabilized Single-Frequency Verticle-External-Cavity AlGaAs Laser, <i>IEEE Photonics Tech. Lett.</i> 11, 12, <b>1999</b> , p. 1551.
AW	M.A. Holm et al, "High-power diode-pumped AlGaAs surface-emitting laser", <i>Appl. Optics</i> , 38, 27, <b>1999</b> , pp. 5781-5784.
AX	S. Hoogland et al., "Passively mode-locked diode-pumped Surface-emitting semiconductor laser", <i>IEEE Photonics Tech. Letters</i> , Vol. 12, No. 9, <b>2000</b> , p. 1135-1137.
AY	H.Q. Hou et al., "MOVPE Growth of High Performance 1.06 $\mu$ m Selectively Oxidized Vertical-Cavity Surface Emitting Laser", <i>OSA Tops</i> , Vol. 15, <b>1997</b> , p. 106-111.
AZ	W. Jiang et al, "Analysis of Laser Pulse Chirping in Mode-Locked Verticle-Cavity Surface-Emitting Lasers", <i>IEEE Journal of Quantum Electronics</i> , Vol. 29, No. 5, <b>1993</b> , p. 1309.
BA	X. Jin et al., "Microwave Modulation of a Quantum-Well Laser with and without External Optical Injection", <i>IEEE Photon Tech. Letters</i> , Vol. 12, No. 7, <b>2001</b> , p. 648-650.
BB	U. Keller, "Semiconductor Saturable Absorber Mirrors (SESAM's) for Femtosecond to Nanosecond Pulse Generation in Solid-State Lasers", <i>IEEE Journal of Sel. Topics in Quant. Electron.</i> , Vol. 2, No. 3, <b>1996</b> , p. 435-453.
BC	M. Kuznetsov et al, "Design and Characteristics of High-Power (>0.5-W CW) Diode-Pumped Verticle-External-Cavity Surface-Emitting Semiconductor Lasers with Circular TEM <sub>00</sub> Beams", <i>IEEE J of Sel. Topics Quant. Electron.</i> , 5, 3, <b>1999</b> , p. 561.
BD	M. Kuznetsov et al., "High-power (>0.5 W CW) Diode-pumped Vertical-External-Cavity Surface-Emitting Lasers with Circular TEM <sub>00</sub> Beams", <i>IEEE Photonics Tech. Lett.</i> , 9, 1063-1065, <b>1997</b> .
BE	C.P. Lee et al., "Dual-wavelength Bragg reflectors using GaAs/AlAs multilayers", <i>Electronics Letters</i> , Vol. 29, No. 22, <b>1993</b> , p. 1980-1981.
BF	Z.L. Liau et al., "Nanometer air gaps in semiconductor wafer bonding", <i>Applied Physics Letters</i> , Vol. 78, No. 23, <b>2001</b> , p. 3726-3728.
BG	Z.L. Liau et al., "Semiconductor wafer bonding via liquid capillarity", <i>Applied Physics Letters</i> , Vol. 77, No. 5, <b>2001</b> , p. 651-653.
BH	Y.H. Lo et al., "Semiconductor lasers on Si substrates using the technology of bonding by atomic rearrangement", <i>Appl. Phys. Lett.</i> , Vol. 62(10), <b>1993</b> , p. 1038-1040.

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BI	D.J. Lovering et al., "Optimisation of dual-wavelength Bragg mirrors." <i>Electronics Letters</i> , Vol. 32, No. 19, 1996, p. 1782-1784.					
BJ	M.D. Mermelstein et al., "RIN transfer analysis in pump depletion regime for Raman fibre amplifiers", <i>Electronics Letters</i> , Vol. 38, No. 9, 2002, p. 403-405.					
BK	P. Michler et al., "Emission Dynamics of $In_{0.2}Ga_{0.8}As/GaAs$ $\lambda$ and 2 $\lambda$ Microcavity Lasers", <i>Applied Physics Letters</i> , American Institute of Physics, New York, US, Vol. 68, No. 2, 1996, pages 156-158.					
BL	S.S. Murtaza et al., "High-Efficiency, Dual-Wavelength, Wafer-Fused Resonant-Cavity Photodetector Operating at Long Wavelengths", <i>IEEE Photon. Tech. Lett.</i> , Vol. 7, No. 6, 1995, p. 679-681.					
BM	Y. Onishi et al., "Design and Fabrication Process of Optically Pumped $GaInAsP/InP$ Stripe Laser with Resonant Pumping for High-Power Operation", <i>Japanese Journal of App. Phys.</i> , Vol. 40, 2001, p. 4920-4921.					
BN	M.Y.A. Raja et al., "Resonant Periodic Gain Surface-emitting Semiconductor Lasers", <i>IEEE J. Quantum Electron.</i> , Vol. 25, No. 6, 1989, pp. 1500-1512.					
BO	E. Schiehlen et al., "Diode-Pumped Semiconductor Disk Laser With Intracavity Frequency Doubling Using Lithium Triborate (LBO)", <i>IEEE Photonics Tech. Lett.</i> 14, 6, 2002, p. 777.					
BP	M. Schulze et al, "Efficiency Experts", <i>Photonics Spectra</i> , May 2001.					
BQ	M. Schulze, "Technologischer Durchbruch mit blauen Festkörperlasern", <i>Photonik</i> 3, 2001.					
BR	C. Stewen et al., "A 1-k W CW Thin Disc Laser", <i>IEEE J. of Sel. Topics Quant. Electron.</i> , Vol. 6, No. 4, 2000, p. 650-657.					
BS	A. Valentini et al., <i>Electronics Letters</i> , Vol. 35, No. 11, 1999, p. 896-897.					
BT	E. Yablonovitch et al., "Van der Waals bonding of GaAs epitaxial liftoff films onto arbitrary substrates", <i>Appl. Phys. Lett.</i> , Vol. 56, No. 24, 1990, p. 2419-2421.					
BU	F. Yang et al., "Edge-emitting quantum well laser with Bragg reflectors", <i>Appl. Phys. Lett.</i> , Vol. 66, No. 22, 1995, p. 2949-2951.					
BV	Coherent Laser Division. Sapphire Optically Pumped Semiconductor Lasers, Copyright 2002, Coherent, Inc.					
BW	Coherent® Product Information. Sapphire 488 & 460 LP, Copyright 2006, Coherent, Inc.					
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